

## **MICROBIAL PRODUCTS IN A SUSTAINABLE GARDEN STATE & BEYOND**

11:680:103, 3 credits Fall semester 2022

Mondays & Thursdays 8:30-9:50AM

Cook/Douglass Lecture Hall 101

### **CONTACT INFORMATION:**

Instructor: Dr. Karla Esquilín-Lebrón (she/her/ella)

Office Location: 215 Lipman Hall

Phone: [Click here to enter text](#) Email: [karla.esquilin@rutgers.edu](mailto:karla.esquilin@rutgers.edu)

Office (Student) Hours: Available upon request (in person or virtual meetings). Office hours are a time for all students in this class to have an opportunity to meet with me. Email me to find the best available time for us to meet.

### **COURSE MATERIALS:**

- There is no textbook for the course. Reading material, podcasts, lecture notes, and assignments will be posted on Canvas.

### **COURSE DESCRIPTION:**

The Microbial Products in a Sustainable Garden State & Beyond is a 3-credit lecture and interdisciplinary engaged learning experience for undergraduate students with no science background required.

The course explores the science and culture of microbial agricultural products through readings, lectures, group projects. The course combines applied microbiology with an appreciation of cultural heritage, on site, in New Jersey. This dynamic program investigates the microbiology of agricultural products and food and beverage fermentations, such as cheese production, wine and beer fermentation, fermented sausages, and mushroom cultivation. Students will learn about the factors that control microbiological growth and activity, and how humans exploit and manipulate microbes in food and beverage production and agricultural practices. Students will study the complex chemical and biological processes that create different fermented foods, with techniques that blend modern scientific knowledge with traditional values and practices.

### **COURSE STRUCTURE**

During the semester, we will meet in person Mondays & Thursdays, some days will be devoted to classroom discussion and group assignments, while other days will involve invited speakers and excursions to local sites on and off campus. Readings, lectures, group projects, presentations, and field trips meld a comprehensive appreciation of the science, history, and culture of fermented foods and other agricultural products.

### **LEARNING GOALS:**

By the end of the course, students should be able to:

1. Describe the role of various microorganisms and how they impact humans, food, and the environment.
2. Articulate how microbial food fermentation is both an art & craft as well as an example of both science & technology.
3. Compare and contrast the microbial principles relating to the production of cheese, wine, sausages, beer, and other fermented foods.
4. Analyze different claims about current issues in food microbiology and agriculture and discuss these issues using evidentiary support.
5. Evaluate the role of cultural heritage, using evidence, in the worldwide production, commerce and consumption of fermented agricultural products.



## **SAS and SEBS Core Curriculum Learning Goals**

### **I: 21st Century Challenges**

1. Analyze the relationship that science and technology have to contemporary social issues.

### **II: Areas of Inquiry**

#### **A: Natural Sciences**

1. Understand and apply basic principles and concepts in the physical or biological sciences.
2. Identify and critically assess ethical and societal issues in science.

## **ASSIGNMENTS/RESPONSIBILITIES, GRADING & ASSESSMENT:**

### Course Grading breakdown

The course grade will be based on:

- a) 4 exams (50pts each, drop the lowest and no makeups)
- b) In-class activities & participation (10% weight)
- c) 3 assignments submissions (20pts each)
- d) 2 reports (group report 50pts written and 25pts presentation, individual report 50pts)

### Examination

All exams will be through Canvas. There will be four exams scheduled throughout the semester. Exams will combine multiple choice, matching, and short answer questions.

### Course Excursions

Group and individual excursions are incorporated throughout the course. Take detailed notes on visits and excursions. Short reports addressing a questionnaire will be submitted approximately one week following each excursion. Specific questions to address: How has the experience changed your view on the role of gastronomy in daily life? How does the way we approach food (both its production and its consumption) tell us about ourselves and our society?

### In-class Activities and Class Participation

Students are expected to participate in group discussions which will occur regularly throughout the semester. In-class assignments and activities will be in a variety of activities; hands-on activities, Kahoots, case studies, think-pair share and other activities to promote discussion and critical thinking. To help you prepare for in-class activities reading materials, blogs, podcasts, videos, and others will be posted on Canvas. The dates of the activities are indicated in the course schedule under Activities. In-class activities are 10% of your grade and cannot be make up. I will drop two missed assignments.

### Report 1: Group Report and Presentation Fermented Food Products

Groups will prepare a written research report and class presentation. Students will select a particular fermented agricultural product not previously discussed during class (e.g. cheese variety, beer, wine, sausage or other) and discuss its characteristics, source of raw materials, production process, taste & aroma, history, trade. Written report must also examine the impact of changes in agricultural practices over the last century on the production of the fermented product or its environment.

### Report 2: Individual Report

Students will select a fermented product to prepare a Factsheet for a general audience. Must include the

microbiological and biochemical processes that occur during the production of the product.

### **FINAL EXAM**

No Final exam for this course.

### **COURSE POLICIES (in alphabetical order)**

This syllabus contains the policies and expectations that have been established for this course. These policies and expectations are intended to create a productive learning atmosphere for all students. Please bring any concerns you may have to my attention.

### **ABSENCE POLICY**

Students are expected to attend every in-person class meeting and scheduled excursions. Assignments missed as a result of an unexcused absence will result in loss of points. I understand that the COVID-19 pandemic brings with it a variety of health and emotional challenges. For example, you may become ill or may have to quarantine as a result of COVID-19. Students are expected to attend all classes; if you expect to miss one or two classes, please use the University absence reporting website <https://sims.rutgers.edu/ssra/> to indicate the date and reason for your absence. An email is automatically sent to me.

### **ACADEMIC INTEGRITY**

All members of the Rutgers community are expected to adhere to the Code of Conduct and Academic Integrity Policies, which can be found at <http://studentconduct.rutgers.edu> (Links to an external site.) (Links to an external site.). Any violation of this code will result in a sanction depending on severity of the offense. The use of phones or any other electronic devices during an exam period will result in a zero for that exam.

Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com (directly or via Canvas for the detection of plagiarism).

The university's policy on Academic Integrity is available at <http://academicintegrity.rutgers.edu/academic-integrity-policy>. The principles of academic integrity require that a student:

- properly acknowledge and cite all use of the ideas, results, or words of others.
- properly acknowledge all contributors to a given piece of work.
- make sure that all work submitted as his or her own in a course or other academic activity is produced without the aid of impermissible materials or impermissible collaboration.
- obtain all data or results by ethical means and report them accurately without suppressing any results inconsistent with his or her interpretation or conclusions.
- treat all other students in an ethical manner, respecting their integrity and right to pursue their educational goals without interference. This requires that a student neither facilitate academic dishonesty by others nor obstruct their academic progress.
- uphold the canons of the ethical or professional code of the profession for which he or she is preparing.

Adherence to these principles is necessary in order to ensure that

- everyone is given proper credit for his or her ideas, words, results, and other scholarly accomplishments.
- all student work is fairly evaluated and no student has an inappropriate advantage over others.
- the academic and ethical development of all students is fostered.
- the reputation of the University for integrity in its teaching, research, and scholarship is maintained and enhanced.

Failure to uphold these principles of academic integrity threatens both the reputation of the University and the value of the degrees awarded to its students. Every member of the University community therefore bears a responsibility for ensuring that the highest standards of academic integrity are upheld.

## **ACCOMODATIONS FOR STUDENTS WITH DISABILITIES**

Rutgers University welcomes students with disabilities into all the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines> (Links to an external site.) (Links to an external site.). If the documentation supports your request for reasonable accommodations, the Office of Disability Services will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations as early as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form> (Links to an external site.) (Links to an external site.).

## **EMAIL POLICY**

Please use CANVAS or Scarletmail for any communications in this course. I will respond to email within 24 hours, Monday through Friday between 9am to 6pm. I reserve the right to wait until Monday to reply to messages sent over the weekend.

## **OH NO! Life happens clause/ LATE SUBMISSION**

Assignments turned in late will earn 75% of points. Late submissions will only be accepted a week after the due date. No late submissions will be accepted for the group project and the Factsheet individual project.

## **STANDARD SEMESTER GRADES**

Students are graded at the end of each course, in accordance with the grades and symbols authorized by the University Faculty Senate, as follows:

A (90-100)      C (70-74)

B+ (85-89)     D (60-69)

B (80-84)      F (0-59)

C+ (75-79)     W = ASSIGNED BY REGISTRAR to students who officially withdraw from a course

## **STUDENT WELLNESS SERVICES**

Just In Case Web App <http://codu.co/cee05e>

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ [www.rhscaps.rutgers.edu/](http://www.rhscaps.rutgers.edu/)

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / [www.vpva.rutgers.edu/](http://www.vpva.rutgers.edu/)

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

**Disability Services**

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / <https://ods.rutgers.edu/>

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: <https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

**Scarlet Listeners**

(732) 247-5555 / <https://rutgers.campuslabs.com/engage/organization/scarletlisteners>

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.

**COURSE SCHEDULE (tentative)**

Lecture	Date	Lecture Topics	In-Class Activity	Assessment submissions
				Introduce yourself DUE before class 9/8
1	Sept/8	Intro to course Exploring the Microbial World together!	First Day info sheet	
2	Sept/12	Life and Microbes/ Microbes making a living	Discuss: A World Without Microbes, Central Dogma	
3	Sept/15	Microbial diversity; Microbiomes	Digestive system Microbiome	
4	Sept/19	<a href="#">International Microorganism Day</a> Cook Farm & Hyacinth visit	Meet at Cook Farm College Farm Road	
5	Sept/22	Humans, Agriculture, and Microbes		
6	Sept/26	History of Living Foods/ Benefits of Fermentation	Discussion: Wild Fermentation and the Power of Bacteria	
7	Sept/29	Environmental factors effecting microbial growth /Food Spoilage	Poisoned picnic activity Exam review	
8	Oct/3	Microbiology and Biochemistry of Food Fermentations: alcoholic fermentations	Discuss a Factor	<b>EXAM I (Lectures 1-6)</b>
9	Oct/6	Brewery visit Cypress Brewing Company	Meet at 8:45AM at 30 Nixon Ln. Unit 1E Edison NJ 08837	
10	Oct/10 <a href="#">Indigenous People Day</a>	The role of culture and tradition in fermentation/ Indigenous fermented products	Article discussion Divide into group projects	Group contract
11	Oct/13	Library workshop with Dr. Judit Ward	Meet at Douglass library	Library assignment
12	Oct/17	Fermented Fruits (Wines, Cider and Ports)		Design your own vineyard
13	Oct/20	Fermented Milk products: cheese	Taste-olfactory evaluation of cheese varieties	
14	Oct/24	Other Fermented Milk products: yogurt, kefir	Discuss a Cheese Exam review	
15	Oct/27	Breads	Gastroegyptology discussion, Sourdough materials	<b>EXAM II (Lectures 7-14)</b>
16	Oct/31	Mushrooms and Fungi	Discussion: Present your Fungi	Farmer's Market Excursion
17	Nov/3	History of Agriculture in New Jersey	Library exhibit Christine Lutz	

18	Nov/7	Fermented Vegetables (Sauerkraut, Kimchi, Pickles)		Group project draft
19	Nov/10	Fermented meats	Discuss: Sausages of the World Exam review	<b>EXAM III (Lectures 13-18)</b>
20	Nov/14	Microbiology of Honey (Mead), Kombucha		
21	Nov/17	Group presentations		Peer reviews
22	Nov/21	21 <sup>st</sup> century problems & Microbial solutions	From where our produce comes from?	
23	Nov/24	Thanksgiving break (no class)		
24	Nov/28	Agritourism: What is agritourism? Why is it important in New Jersey?	Invited speaker Dr. Claudia Gil Arroyo	Sourdough starter project
25	Dec/1	Bioprospecting	Case studies	Final Group project submission
26	Dec/5	Impacts of climate change for agriculture in the region	Exam review	
27	Dec/8	Fermentation facility at Waksman Institute (Busch campus)	Meet Dr Arvin Cesar Lagda	Fact sheets submission
28	Dec/12	A summary: From fundamentals to applications		<b>EXAM IV (Lectures 19-26)</b> Peer review Factsheets